BIG OX ENERGY

Slug Control Plan

South Sioux City, NE

Developed and Implemented: September 1, 2017

I. ***Purpose***

As required by 40 CFR 403.8, Big Ox Energy (BOE) is required to develop and implement best management practices (BMP's) and engineered controls to prevent the release of pollutants that have the potential to interfere with or are incompatible for treatment by the Publicly Owned Treatment Works (POTW). A slug load is defined by federal code as being:

"*A discharge of non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge which has a reasonable potential to cause interference or pass through or in any other way violate the POTW's regulations, local permits or permit conditions.*"

Big Ox Energy is permitted for wastewater discharge by the City of Sioux City under permit number 2016-31-I. This permit currently only contains a discharge limit for pH. The discharge limit is 5.0-11.5 s.u., however, the municipal sewer use ordinance Chapter 114-374 in South Sioux City, NE has a discharge limit for pH of no less than 5.5 s.u. and no greater than 9.5 s.u. Until the time that BOE is able to pump around Bennett Lift Station for direct conveyance to Sioux City, the effluent discharge must meet the more stringent of the two limits. At such time that the pump around is complete, the issued pH permit limit from Sioux City will be adhered to.

II. ***Facility Information***

Facility Name:	Big Ox Energy Siouxland, LLC
Facility Address:	1616 D Ave, South Sioux City, NE 68776
Owner:	Big Ox Energy, LLC, 6601 County Road R, Denmark, WI 54208
Legal Description:	NW ¼, Section 4, Township 28N, Range 47W (Dakota County)
Location:	42.436° North Latitude, -96.422° West Longitude
Facility Contact:	Perry Winkler, (920)-615-1459, pwinkler@bigoxenergy.com
Authorized Representative:	Desiree McCaslen, (920)-615-2620, dmccaslen@bigoxenergy.com
SIC Code:	4952-Sewage System
NAICS Code:	221320-Sewage Treatment Facilities

III. ***Facility Process Summary***

Big Ox Energy owns and operates a renewable fuels facility that anaerobically digests organic wastes to produce biogas which is injected into the Northern Natural Gas pipeline as renewable energy and preliminary wastewater treatment system which discharges to the City of South Sioux lift station for conveyance to the Sioux City Wastewater Treatment Plant (WWTP).

The anaerobic digestion process consists of an equalization tank for hauled in organic based waste, anaerobic digesters for the breakdown of the organic waste, sludge dewatering equipment and gas handling equipment. The hauled waste receiving area is separate from the wastewater treatment system and there is no ability for a hauled in waste to directly impact the effluent quality of the wastewater discharging from the facility without first going through the anaerobic digestion process.

Following anaerobic digestion, the sludge is processed through centrifuges that dewater the sludge. The sludge is disposed of third party, and the centrate is pumped into the wastewater EQ tank. The centrate is blended with the influent industrial/sanitary wastewater and is processed through a Gas Energy Mixing (GEM) system.

The wastewater treatment system is comprised of a flow equalization tank, chemical dosing and GEM for the neutralization and solids removal of the industrial flow. Once treated the wastewater discharges to Bennett lift station in South Sioux City via force main for conveyance to the Sioux City Wastewater Treatment Plant. Each discharging industry is required to have an effluent pH meter, flow meter and sampler to ensure discharges are

within acceptable ranges as required by South Sioux City municipal code Chapter 14. As an additional assurance, Big Ox Energy has pH meters at both Roth and BPI lift stations to monitor the pH coming into the facility.

There is the potential if the GEM system EQ tank gets to overflow level that the comingled wastewater would overflow untreated to the City of Sioux City. This overflow is captured in the effluent wet well for flow monitoring and sampling by the effluent composite sampler.

The waste streams that are collected and preliminarily treated by the GEM system are:

Waste Source:	***Waste Stream:***	***Average Discharge Volume:***
Beef Products Inc.	Meat Processing	0.900 MGD
CHS	Soy Protein Isolate	0.550 MGD
Richardson Milling	Coated Oats	0.020 MGD
Big Ox Centrifuge Centrate	Sludge Dewatering	0.225 MGD
Sanitary/Process	Sanitary/Process	0.041 MGD

The GEM system EQ tank is monitored for pH and it is adjusted as needed to keep the pH within an acceptable range for the polymers to function efficiently. The wastewater is pumped from the EQ Tank through a rotary screen, through the flash tanks where the polymers are added and to the GEM for solids separation. The solids from the rotary screen and the GEM are put back into the anaerobic digester EQ tank and the GEM system effluent discharges. The effluent flow is monitored and totalized once per day, a report is sent to Sioux City once per month. The effluent discharge is also sampled by a flow paced discrete composite sampler out of which samples are split for internal compliance testing by Big Ox and for compliance testing that is completed by Sioux City.

The current permitted sampling requirements and limits for the wastewater discharge are as follows:

Parameter	***Sample Frequency (BOE)***	***Sample Frequency (Sioux City)***	***SIU Permit Limits***
TSS	Weekly	Weekly	N/A
BOD	Weekly	Weekly	N/A
FOG	Weekly	Weekly	N/A
Total Nitrogen	Weekly	Weekly	N/A
Total Phosphorous	Weekly	Weekly	N/A
pH	Continuous Process Monitor	Monthly Compliance	5.0-11.5 s.u. (Sioux City) 5.5-9.5 s.u. (South Sioux City)

IV. ***Chemical Usage***

Chemicals are used for process control and are stored inside of the main building. There are three floor drains near the chemical storage/staging area that are connected to the main building lift pump (4,000-gallon capacity), which discharges into the GEM system EQ tank. No additional secondary containment is provided as all the floor drains in the main building discharge into the GEM system EQ tank and are monitored and adjusted for pH compliance prior to discharge.

GEM system chemicals are located near the south overhead door where they are vented and hooked up to feed the pumps that flow into the flash tanks for pH adjustment prior to the GEM. There are two floor drains in the vicinity that are connected to the main building lift pump.

The ferric chloride bulk tank is located outside of the main building near the south overhead door. The bulk tank is double walled, which complies with secondary containment requirements for this chemical. The transfer piping is located inside the building where any discharge resulting from equipment leaks or failures would go into the floor drain system to the main building lift pump.

The gas handling chemicals are located on the southwest corner of the property in a non-class 1 area. Chemicals are stored in a small building, which serves as secondary containment and has no effect on the wastewater generated or treated at the facility.

A summary of the chemicals used or stored at the facility are as follows:

Chemical	***Characteristic of Concern***	***Location***	***Volume***
Muriatic Acid	Low pH	Internal	2-275 gallon totes
Sodium Hydroxide	High pH	Internal	2-275 gallon totes
Ferric Chloride	Low pH	External Bulk Tank	12,000-gal bulk tank
Anionic Polymer	Solids separation	Internal	500 gallon make up tank
Cationic Polymer	Solids separation	Internal	500 gallon make up tank
Hydraulic Oil	Acute Toxicity	Internal	55-gallon or consumer sized
Cleaning Chemicals	Low/High pH	Internal	Consumer Size <5 gallons
Lab Chemicals	Low/High pH, Acute Toxicity	Internal	Consumer Size <5 gallons

V. ***Best Management Practices (BMP's)/sludge load control***

The implemented BMPs to prevent pollutants of concern from entering the process and reaching the POTW are:

Potential Source:	***Pollutant of Concern:***	***BMP:***
Main Building Chemical Staging/Storage	Sodium Hydroxide Muriatic Acid Dry Polymer Hydraulic Oil	1. Daily walk through and observation of the chemical areas 2. Monthly inspection of the totes and their fittings 3. Monthly inspection/inventory of spill response kits 4. Spill Response 5. Spill Reporting 6. Annual Employee Training
GEM System	Muriatic Acid Sodium Hydroxide Cationic Polymer Anionic Polymer	
Bulk Ferric Tank	Ferric Chloride	
GEM EQ Tank	pH, TSS and BOD	1. Process levels monitored by process control system 2. Automated operational controls 3. Preventative maintenance for equipment 4. Continuous pH monitoring with automated adjustment

Minor spills or leaks shall be isolated to contain the material inside the building. Plant wet well pumps shall be immediately placed in manual. If compatible for treatment, spill kits and/or absorbent socks shall be used, if necessary to contain or direct the material to the floor drain. Depending on the material spilled, the volume and the options for disposal, a decision shall be made on whether controlled discharge back through the GEM system for neutralization and treatment is acceptable or if it needs to be removed and disposed of offsite. If not compatible for treatment, material shall be captured and disposed of offsite.

Major spills shall be isolated to contain the material inside the building. Plant wet well pumps shall be immediately placed in manual. If volume spilled is manageable and compatible for treatment, spill kits and/or

absorbent socks shall be used if necessary to contain or direct the material to the floor drain. Depending on the material spilled, the volume, and the options for disposal, a decision shall be made on whether controlled discharge back through the GEM system for neutralization and treatment is acceptable or if it needs to be removed and disposed of offsite. If volume is not manageable or is not compatible for treatment, material shall be captured and disposed of offsite.

The facility has spill containment supplies to contain and mitigate a minor and major spill event if necessary.

VI. ***Training***

Annual training shall be completed on the Slug Control Plan as part of our Environmental Training package. Emphasis will be placed on chemical storage, safe work practices and spill prevention and response.

VII. ***Notification***

BOE will notify South Sioux City and Sioux City immediately following a slug discharge to the sanitary sewer system. A phone call shall be made to the appropriate contact person with a follow up email documenting the type, the volume, time and duration of the slug load event and any corrective actions or BMP's put in place to prevent the same type of slug load from occurring again in the future.

Bob Livermore	South Sioux City	402-494-7534	Blivermore@southsiouxcity.org
Tom Pingel	Sioux City WWTP	712-232-8311	Tpingel@sioux-city.org

In the event of an overflow of the GEM EQ tank, BOE shall immediately notify South Sioux City and Sioux City of the overflow. The overflow volume will be calculated and reported to the Sioux City. Overflow concentrations will be collected in the facility effluent sampler as part of the flow paced 24-hour composite.

The facility personnel responsible for compliance with this plan are:

Name	Title	Role	Shift
Perry Winkler	Plant Manager	Primary Spill Coordinator	Always Available
Richard Fields	Operations Supervisor	Primary Spill Coordinator	Always Available
Michelle Morgan	Compliance Technician	Primary Spill Coordinator	Days (M-F)
Asael	Lead Operator	Secondary Spill Response	Rotating days/nights
Jose Martinez	Lead Operator	Secondary Spill Response	Rotating days/nights (M-Sun)
Arturo	Lead Operator	Secondary Spill Response	Rotating days/nights (M-Sun)
Elijah	Lead Operator	Secondary Spill Response	Rotating days/nights (M-Sun)
Desiree McCaslen	Director of Regulatory Comp	Consultation/Advisory	Always Available

VIII. Certification

Based upon my inquiry of the staff and the personnel directly responsible for the preparation of this document, I certify that the information in it is, to the best of my knowledge; true, accurate, and complete, and that Big Ox Energy-Siouxland, LLC will abide by the provisions of this Slug Control Plan.

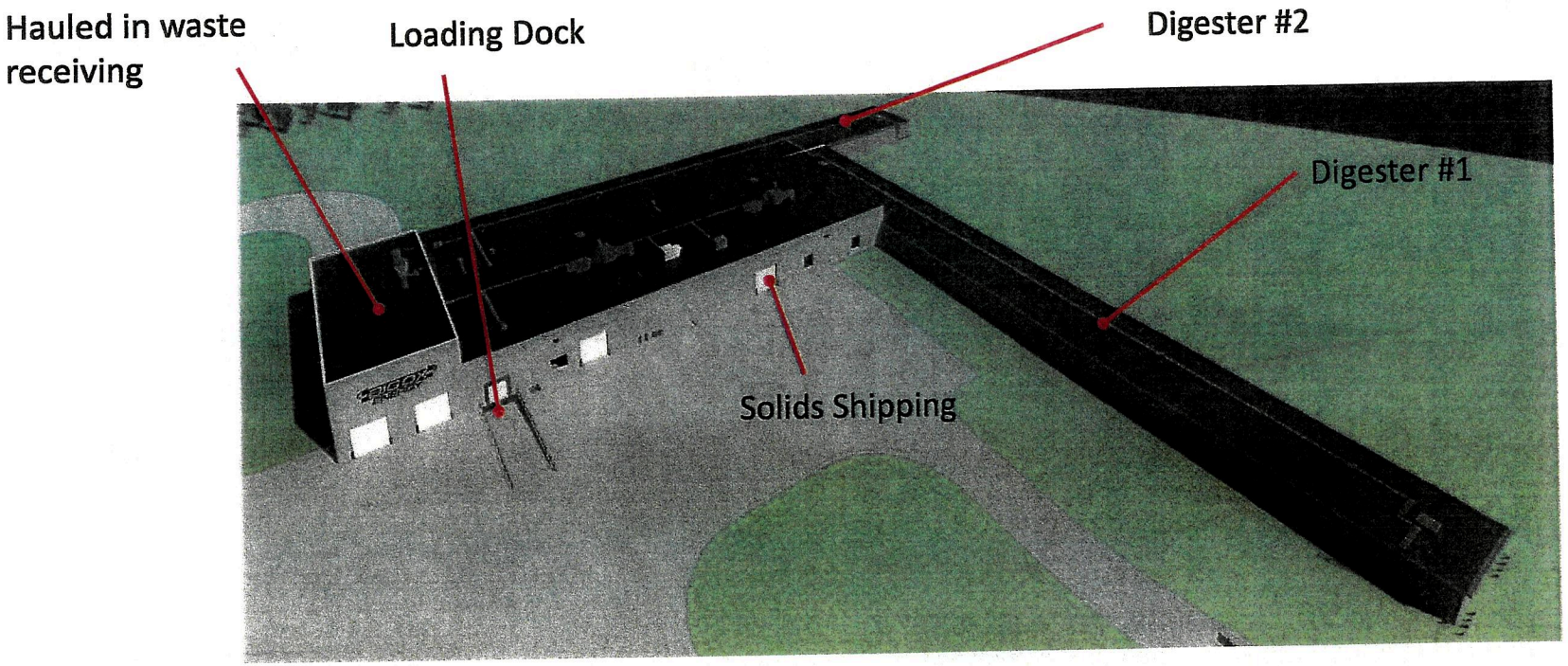
Desiree McCaslen

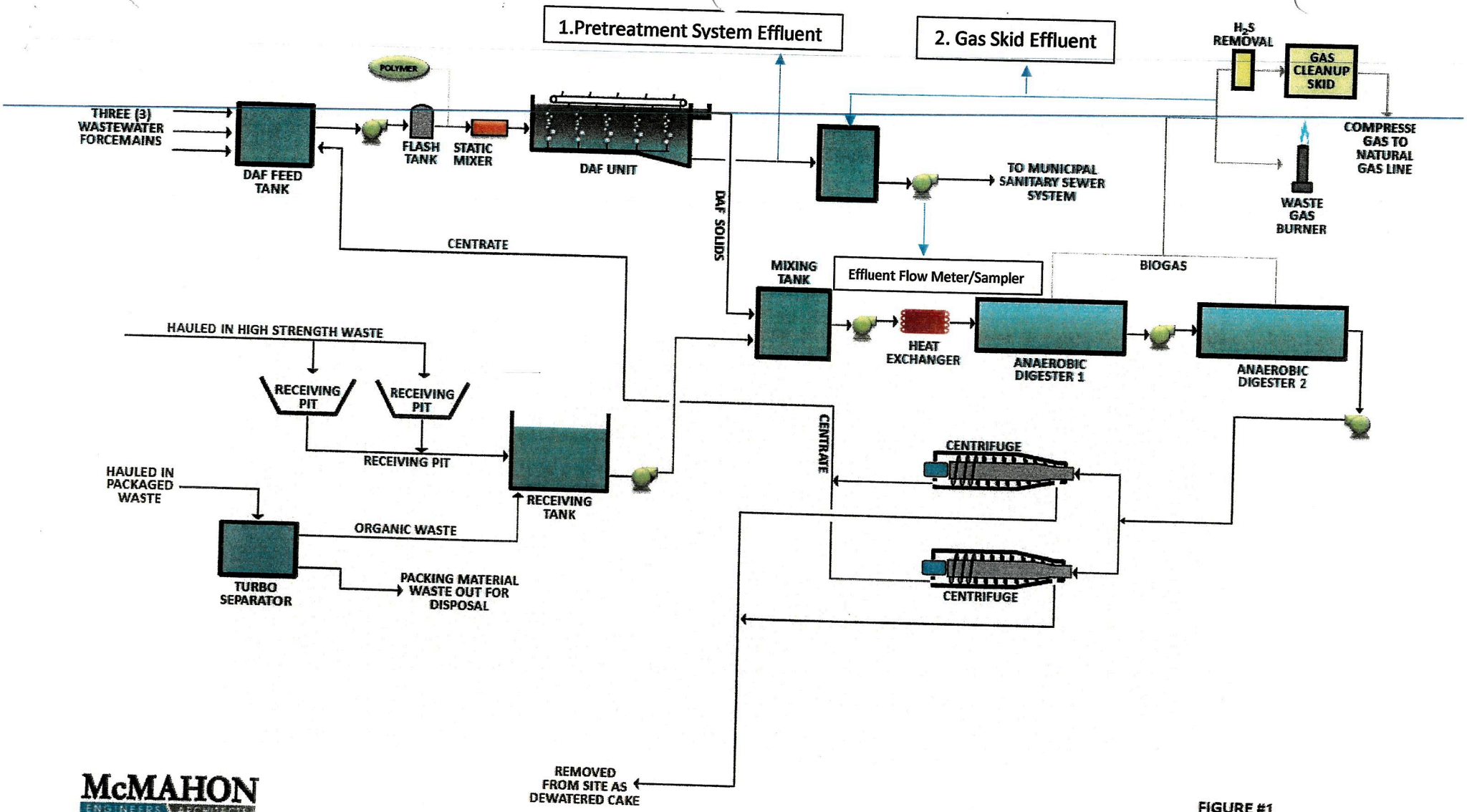
Desiree McCaslen, Director of Regulatory Compliance

8/30/17

Date

Attachment #1-Facility Overview





McMAHON ENGINEERS ARCHITECTS

FIGURE #1
PROCESS FLOW DIAGRAM
BIG OX ENERGY, INC. – SIOUXLAND PROJECT
McM #51076-930180 3/30/2015

Attachment #2